What is claimed is:

1. A method of conveying a high-speed digital data stream, comprising the steps of:

encoding the data stream into two-pulse duplets having a first and a second pulse for each bit of the data stream; and

transmitting a carrierless ultra wideband signal via an antenna, said ultra wideband signal including said duplets.

2. The method of claim 1, wherein said encoding step further comprises setting a phase difference between the first pulse and the second pulse to $\Pi/2$.

3. The method of to claim 2, wherein said encoding step further comprises the steps of:

encoding a cos(wt) for a 1 bit during a first sub-pulse time slot and then a sin(wt) signal second sub-pulse time slot; and

encoding a sin(wt) during a first sub-pulse time and then a cos(wt) in a second sub-pulse time slot.

4. The method of claim 3, wherein:

said encoding step further comprises the steps of combining the encoding with at least one of pulse position modulation and multi-band modulation.; and

within each band, employing at least one of time, amplitude and phase modulations.

5. The method of claim 4, further comprising the step of using a pseudorandom frequency sequence to provide sufficient reduction of multi-user interference.

6. The method of claim 2, further comprising the step of receiving said carrierless ultra wideband signal with a non-coherent receiver.

7. The method of claim 2, further comprising the step of decoding said high-speed digital data stream into a bit stream from said two-pulse duplets included in said received carrierless ultra wideband signal.

8. A high-speed digital data stream embodied in a carrierless ultra wideband signal including two-pulse duplets representing each bit of said data stream, comprising:

at least one data type selected from the group consisting of video, audio, text, image, and data; and

said two-pulse duplets each having a first pulse and a second pulse with a phase difference between the first pulse and the second pulse of Π/2.

9. A high-speed digital data stream embodied in a carrierless ultra wideband signal according to claim 8, wherein said signal controls at least one device selected from the group consisting of video equipment, audio equipment, sensors, alarms, computers, audio-visual equipment, and entertainment systems.

10. A high-speed digital data stream embodied in a carrierless ultra wideband signal including two-pulse duplets representing each bit of said data stream, comprising network traffic to or from a wireless node of a network, wherein said two-pulse duplets each have a first pulse and a second pulse with a phase difference between the first pulse and the second pulse of Π/2.

11. A non-coherent receiver, comprising:

an antenna that receives a carrierless ultra wideband signal conveyed using the method of claim 2 and that includes two-pulse duplets representing each bit of a high-speed digital data stream;

a wideband band-pass filter that filters the received signal;

a low-noise amplifier (LNA), coupled to said band-pass filter, that amplifies said filtered signal;

a gain unit that performs one of amplifying and reducing the signal output by the LNA to an appropriate level;

a bank of voltage controlled oscillators (VCOs) that locally generates a free-running sinusoidal waveform;

a mixer that multiplies the output of the gain unit with the sinusoidal waveform to result in a mixed waveform;

a low pass filter through which the resulting mixed waveform is passed to produce a lo-pass signal; and

a demodulator that converts each two-pulse duplet of the low-pass signal to a single pulse for each bit transmitted via the phase of the low-pass signal.

12. The receiver of claim 11, wherein said received signal further comprises additional bits per pulse that were encoded in the signal using pulse position modulation (PPM).

13. The receiver of claim 11, wherein the demodulator converts each two-pulse duplet into a single pulse that is independent of frequency and phase mismatches.

14. The receiver of claim 11, wherein:

said carrierless wideband signal is a multi-band signal;

an expected center frequency of the received carrierless wideband signal is known in advance; and

the frequency of the VCOs is set equal to that of the received carrierless wideband signal.

15. The receiver of claim 14, wherein the frequency sequence of the received carrierless wideband signal is established by transmission of one of (1) a preamble and (2) a known reference sequence for a short period of time.

16. The receiver of claim 15, further comprising at least one of a RAKE receiver and a receiver based on equalization that processes said received signal and outputs a signal that is combined with the output of the non-coherent signal to produce each bit of the high-speed data signal.